

REMARKS/ARGUMENTS

This paper is being submitted in response to the Office Action dated July 20, 2009. At that time claims 1-8 were pending in the application. Claims 1-3 have been amended. Claims 1-8 are presently under examination. Support for the amendments is found on page 3 of the Specification, and in the claims as originally filed.

In the Office Action, claims 1-8 were rejected under 35 U.S.C. §103(a) over Shepherd, et al. (United States Patent No. 4,155,394). Based on the remarks below, claims 1-8 are presented for reconsideration and allowance by the Examiner.

Rejections under 35 U.S.C. §103(a)

“[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). M.P.E.P. § 2141 sets forth the *Graham* factual enquiries that should be considered when making an obviousness rejection under Section 103: 1) ascertaining the scope and content of the prior art; 2) ascertaining the differences between the claimed invention and the prior art; and 3) resolving the level of ordinary skill in the pertinent art. (Citing *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966).) In addition, M.P.E.P. §§ 2141 and 2142 set forth that “the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit.” (Citing *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. 398, 82 USPQ2d 1385 (2007).) In this case, the claims as pending would not have been obvious over the Shepherd reference.

Fundamentally, Shepherd fails to render claims 1-8 obvious. The difference between Shepherd and claims 1-8 are substantial, beyond that of one of ordinary skill in the art. *See Graham*. The first difference between Shepherd and the claims is that Shepherd fails to teach that “the diameter and cross-sectional area of the first component is less than that of the second component.” *Claim 1*. In contrast, and referring to column 2 lines 41 to 55, Shepherd states that the aramid yarns (cited in the Office Action as the first component) comprise preferably 300 to 550 grams per denier. Shepherd also states that the polyester or nylon yarns (cited in the Office Action as the second component) preferably comprise 25 to 60 grams per denier. Clearly, the aramid yarns are the thicker of the two by an approximate order of magnitude. This is in

complete contrast to the present claims, which requires that “the diameter of the first component be less than that of the second component.”

Furthermore, referring to column 4, lines 18 to 25, Shepherd teaches that the Nylon bundle can comprise a range of 140 to 210 filaments and the polyester bundle 190 to 250 filaments while the aramid bundle can comprise 800 to 1200 filaments. Again, clearly the aramid yarn is the thicker of the two in contrast to the claims. Therefore, for at least this reason, the Shepherd device is different than the claims.

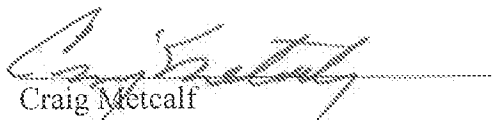
A second difference between Shepherd and the present claims is that Shepherd teaches a cord that exhibits a conventional positive Poisson’s ratio rather than a “composite component having a negative effective Poisson’s ratio.” *Claim 1*. As described above, Shepherd teaches that the aramid bundle has a greater thickness than the nylon bundle. The effect of these relative sizes is that as the cord of Shepherd is stretched the aramid yarns would straighten being equivalent to the straightening of the first component 22 of the present application, illustrated schematically referring to Figures 2 and 3. The helix of the polyester and nylon yarns would therefore increase. However, as the more bulky aramid yarns are straightened the relative decrease in the diameter of the aramid helix would be greater than the corresponding change in the helix of the polyester or nylon resulting in an overall decrease in width of the composite cord when placed under tension. Of course this behavior is in accordance with a composite cord exhibiting a more conventional positive Poisson’s ratio in contrast to the present claims. Therefore, for at least this reason, the Shepherd device is different than the claims.

The Office Action argues that “the cord of Shepherd et al. has sufficiently similar structure to applicant’s composition . . . to lead one to believe that, when stretched, the cord of the prior art would have the ‘inextensible aramid yarn (2) ... straighten out.’” However, it should be noted, that in order to provide a negative Poisson’s ratio the second more elastic component must be thicker than the first component of higher modulus. Accordingly, the overall thickness of the composite cord (comprising first and second components) is increased as the helical diameter of the second component is increased as the first component helix is straightened. For this reason, the Office Action’s argument is incorrect. Therefore, there exist a number of substantial differences between Shepherd and the claims, as discussed above.

It would not be within the skill of one of ordinary skill in the art to modify Shepherd to overcome these differences. First, Shepherds provides no motivation, teaching, or suggestion to modify its cord to have the different component thicknesses or to exhibit a negative Poisson's ratio. Second, the Office Action has failed to meet its burden of expressly identifying "explicit findings of how a person of ordinary skill would have understood the prior art teachings," and "why the differences between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art." MPEP §§ 2141(II) & (III). In particular, the Office Action has failed to expressly indicate why one of ordinary skill in the art would modify the relative thicknesses of the Shepherd bundles, and why such a person would modify the Shepherd cord to make it auxetic. Therefore, in view of this complete absence, there exists no motivation to modify Shepherd to teach the present claims. Accordingly, the present claims are non-obvious over Shepherd.

For these reasons the claims as presented are in condition for immediate allowance. If there are any remaining issues preventing allowance of the pending claims that may be clarified by telephone, the Examiner is respectfully requested to call the undersigned.

Respectfully submitted,



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